

We claim:

- 1. A temporarily protected wafer, comprising:
 - a sensitive area disposed on a surface of the wafer; and
 - a vapor-deposited, water-insoluble temporary protective coating directly contacting and covering the sensitive area;

wherein the protective coating is insoluble in organic solvents;

wherein the coating remains in place during singulation of the wafer into individual device dies; and further

wherein a sufficient amount of the coating is removed to activate the sensitive area prior to completing packaging of the die.

- 2. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a released MEMS device.
- 3. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a pressuresensitive microsensor.
- 4. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a chemically sensitive microsensor.
- 5. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a temperature-sensitive microsensor.
- 6. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a released IMEMS device.
- 7. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a vacuum vapor-deposited coating.
- 8. The temporarily protected wafer of claim 7, wherein the vacuum vapor-deposited coating comprises a parylene polymer.
- 9. The temporarily protected wafer of claim 8, wherein the parylene coating is selected from the group of parylene polymers consisting of poly-para-xylylene, poly-para-xylylene modified by the substitution of a chlorine atom for one aromatic hydrogen, and poly-para-xylylene modified by the substitution of a chlorine atom for two aromatic hydrogens.
- 10. The temporarily protected wafer of claim 8, wherein the parylene coating comprises a copolymer compound formed by blending a reactive parylene monomer with a reactive material.

- 11. The temporarily protected wafer of claim 10, wherein the reactive material comprises a monomer containing an element selected from the group consisting of silicon, carbon, and fluorine, and combinations thereof.
- 12. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises silicon dioxide, silicate glass, or silicon nitride.
- 13. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a metal.
- 14. The temporarily protected wafer of claim 13, wherein the metal comprises aluminum or tungsten.
- 15. (CANCELLED)
- 16. (CANCELLED)

A4

- 17. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises one or more materials selected from the group consisting of a carbon film, an amorphous carbon film, and a diamond-like carbon film.
- 18. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a self-assembled monolayered material.

A5

- 19. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises perfluoropolyether.
- 20. The temporarily protected wafer of claim 1, further comprising exposed bond pads.
- 21. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited using a Chemical Vapor Deposition (CVD) process.
- 22. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited using a Plasma Enhanced Chemical Vapor Deposition (PACVD) process.
- 23. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited at essentially ambient temperature.
- 24. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited by polymerizing a monomeric gas on at least the sensitive area.
- 25. A temporarily protected die, comprising:

a sensitive area disposed on a surface of the die; and

a vapor-deposited, water-insoluble temporary protective coating directly contacting and covering the sensitive area;

wherein the protective coating is insoluble in organic solvents; and wherein a sufficient amount of the coating is removed to activate the sensitive area prior to completing packaging of the die.

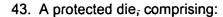
- 26. The temporarily protected die of claim 25, wherein the sensitive area comprises a released MEMS device.
- 27. The temporarily protected die of claim 26, wherein the temporary protective coating comprises a parylene polymer.
- 28. (AMENDED) A temporarily protected wafer, comprising:
 - a sensitive area disposed on a surface of the wafer comprising a released MEMS device having a released MEMS element;
 - a performance-enhancing coating disposed directly on the released MEMS element; and a vapor-deposited, water-insoluble temporary protective coating disposed directly on top of the performance-enhancing coating;
 - wherein the coating remains in place during singulation of the wafer into individual device dies, and further wherein a sufficient amount of the coating is removed to rerelease the MEMS element prior to completing packaging of the die, without removing the performance-enhancing coating.
- 29. The temporarily protected wafer of claim 28, wherein the performance-enhancing coating comprises one or more materials selected from the group consisting of an anti-stiction film, an adhesion-inhibiting film, a lubricant, and a nitrided-surface.
- 30. The temporarily protected wafer of claim 28, wherein the performance-enhancing coating comprises one or more materials selected from the group consisting of perfluoropolyether, hexamethyldisilazane, and perfluorodecanoic carboxylic acid.

731-34. (CANCELLED)

- 35. The temporarily protected wafer of claim 1, wherein the temporary protective coating is insoluble in organic solvents heated to less than or equal to 150 C.
- 36. The temporarily protected wafer of claim 1, wherein the temporary protective coating is excluded from covering any wafer streets.
- 37. The protected die of claim 25, wherein the die is attached and electrically interconnected to a package.
- 38. The die of claim 37, wherein the sensitive area comprises a released MEMS element.
- 39. The die of claim 37, wherein the die is wirebonded to the package.
- 40. The die of claim 37, wherein the die is flip-chip bonded to the package.
- 41. The die of claim 38, wherein the temporary protective coating is sufficiently thick so as to immobilize the released MEMS element.
- 42. The die of claim 38, wherein the temporary protective coating is sufficiently thin so as to not immobilize the released MEMS element.



A8



a sensitive area disposed on a surface of the die, the area comprising a released MEMS device having a released MEMS element;

a performance-enhancing coating disposed directly on the released MEMS element; and a vapor-deposited, water-insoluble temporary protective coating disposed directly on top of the performance-enhancing coating;

wherein the protective coating is insoluble in organic solvents; and wherein the die is attached and electrically interconnected to a package.

44. The die of claim 43, wherein the temporary protective coating is sufficiently thin so as to not immobilize the released MEMS element.

29